

ABSTRACT

Disclosed is a hydrated sodium-cobalt oxide exhibiting superconductivity at low temperatures. The hydrated sodium-cobalt oxide comprises a plurality of CoO_2 layers each having edge-sharing CoO_6 octahedra, and a combination of two water molecule layers and a single sodium ion layer, interposed between the adjacent CoO_2 layers, wherein the distance between the adjacent CoO_2 layers is in the range of 9.5 to 10.5 Å. The present invention provides the first cobalt oxide exhibiting superconductivity. The hydrated sodium-cobalt oxide has an extremely large distance between cobalt layers, and includes highly diffusible sodium ions and water molecules between the layers. Thus, based on high ability of ion-exchanging with various ion species and molecules, the hydrated sodium-cobalt oxide can be effectively used as a precursor for synthesizing materials through ion exchanging.